Residential Housing Starts and Prototypes

2008 California Building Energy Efficiency Standards

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Housing Starts

- Used to estimate statewide impacts
- Weight results by construction activity in each climate zone
- Update data to 2005 data
- Add data for multifamily

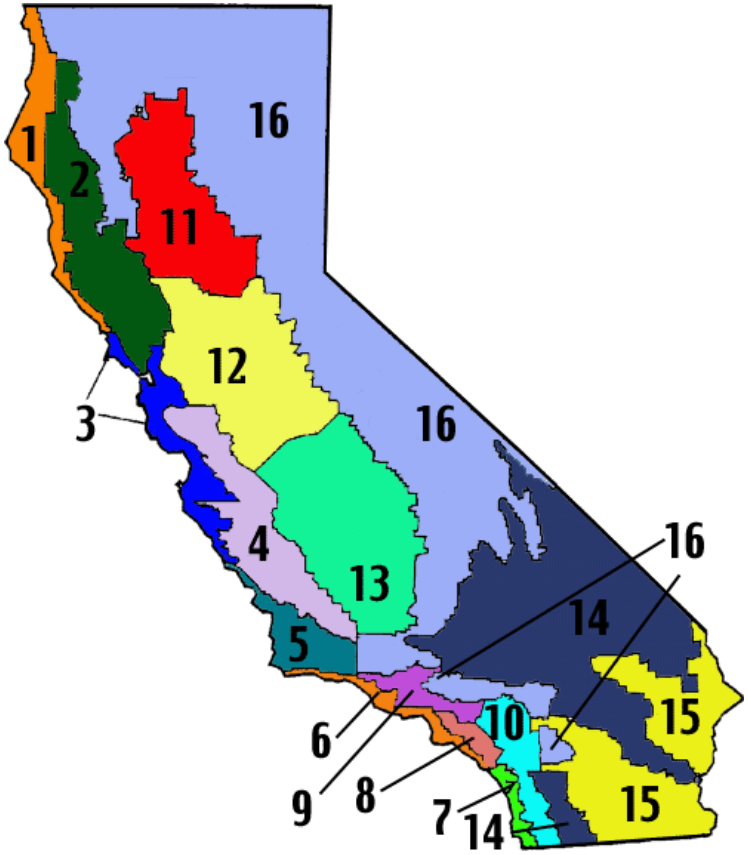
Construction Industry Research Board (CIRB)

- Non-profit group
- Collects construction activity information by city and county
- Similar data used in 2001 and 2005
- Data based on county information

Climate Zone Assignment

- Some counties contain multiple climate zones
- Los Angeles county has 5 climate zones for example
- Thanks to Chad McGhie at Consol, Inc. for sharing data on assigning county data into climate zone data

Climate Zone Assignment



Housing Starts by Climate Zone

2005 CIRB Building Permits						
Climate	Single Family	Multi Family	Total	Single Family	Multi Family	Total
1	350	35	385	0.2%	0.1%	0.2%
2	2816	1441	4257	1.8%	2.7%	2.0%
3	4853	5594	10446	3.1%	10.5%	5.0%
4	4158	3554	7712	2.7%	6.7%	3.7%
5	1172	355	1527	0.8%	0.7%	0.7%
6	6313	6083	12396	4.1%	11.4%	6.0%
7	4203	3929	8132	2.7%	7.4%	3.9%
8	3377	2935	6312	2.2%	5.5%	3.0%
9	4336	4562	8898	2.8%	8.6%	4.3%
10	23819	4956	28775	15.4%	9.3%	13.8%
11	10382	868	11250	6.7%	1.6%	5.4%
12	32062	5079	37142	20.7%	9.6%	17.9%
13	19015	3332	22347	12.3%	6.3%	10.7%
14	15606	6858	22464	10.1%	12.9%	10.8%
15	14034	1881	15915	9.1%	3.5%	7.7%
16	8338	1691	10029	5.4%	3.2%	4.8%
Total	154834	53153	207987	100.0%	100.0%	100.0%

2001 vs 2005 Comparison

2001 vs 2005 Single Family			
Climate	2001	2005	Percent Difference
1	349	350	0%
2	3597	2816	-22%
3	5995	4853	-19%
4	7532	4158	-45%
5	1417	1172	-17%
6	4807	6313	31%
7	8404	4203	-50%
8	6246	3377	-46%
9	6605	4336	-34%
10	16448	23819	45%
11	5657	10382	84%
12	21070	32062	52%
13	8960	19015	112%
14	5417	15606	188%
15	3957	14034	255%
16	2540	8338	228%
Total	109000	154834	42%

Prototypes

- Used when estimating statewide impacts of changes
- Used when verifying life cycle cost effectiveness
- Last updated in early 1990's
- Home sizes have grown substantially
- More two story homes

Data Collection

- Sent emails and phone calls to stakeholders.
- Received data from Consol, Inc., RLW Analytics Inc., Roseville Electric and SMUD.
- Much of data for homes participating in utility incentive programs.

Data

Sample Description			
Source	Sample	Type	Description
Consol, Inc.	7000	Median	2005/2006 data
Roseville Electric	993	Average	2005 Roseville Electric Advantage Home participants
SMUD	6690	Average	2005 SMUD Advantage Home participants
RLW Analytics Inc.	6850	Average	2002/2003 Energy Star Home Data
Total	21533		

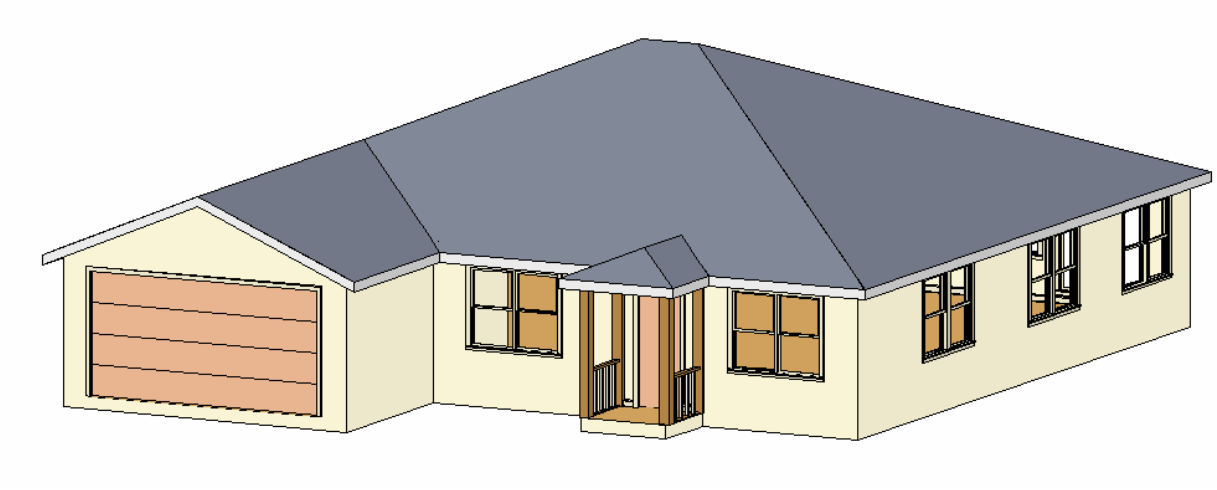
Floor Area (ft2)		
	One Story	Two Story
Consol, Inc.	2126	2873
Roseville Electric	2176	2348
SMUD	1954	2585
RLW Analytics Inc.	2196	2570
Average	2113	2594
Weighted	2097	2663

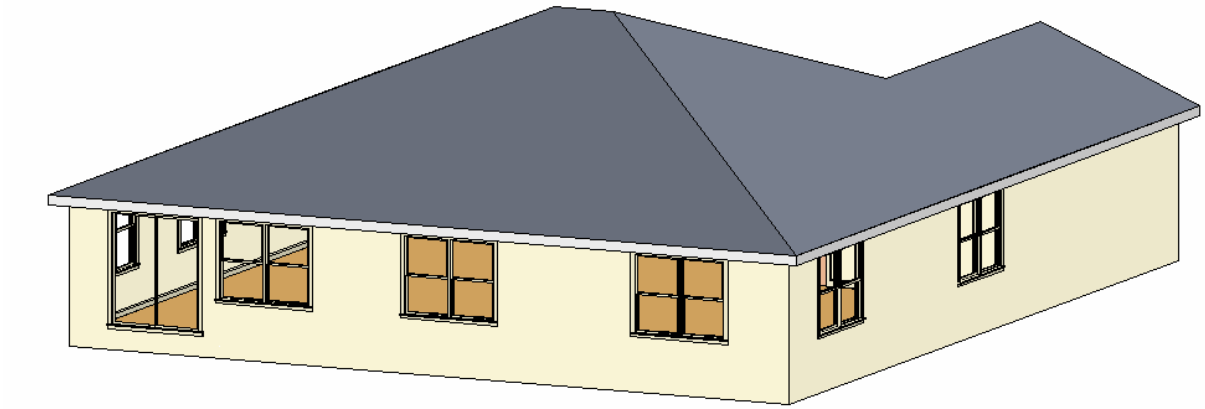
Number of Stories (%)		
	One Story	Two Story
SMUD	50%	50%
RLW Analytics Inc.	39%	61%
Average	45%	55%
Weighted	45%	55%

Proposal

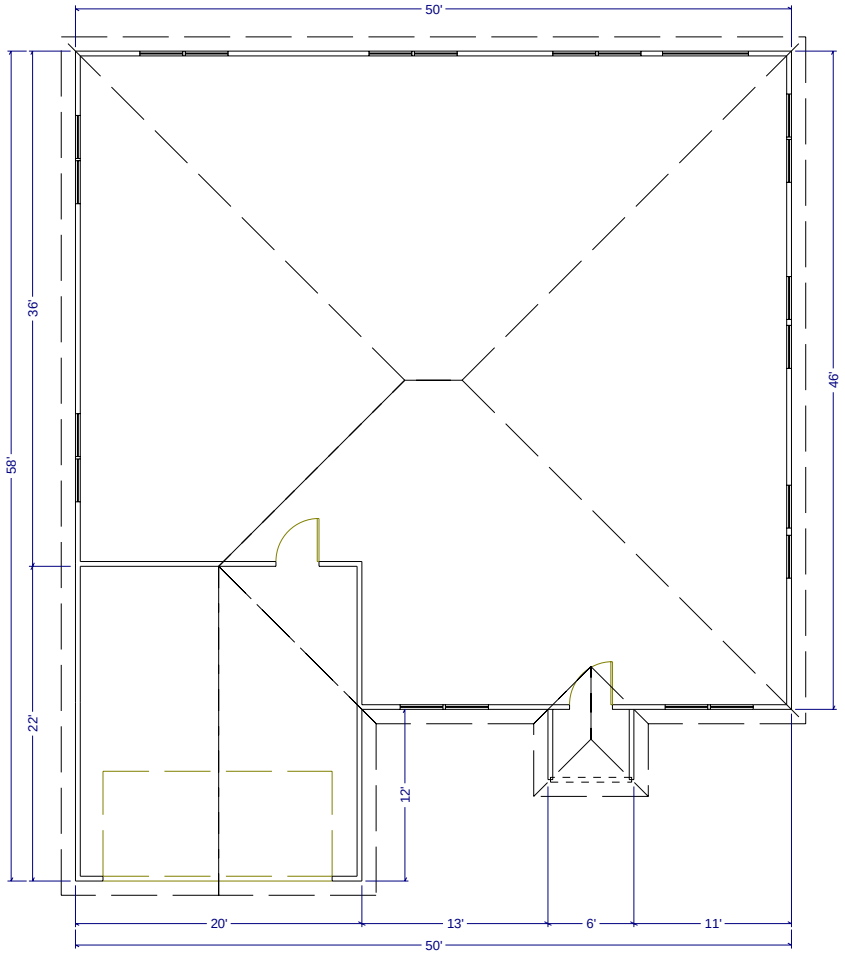
- Keep dimensions simple
- Provide easy to duplicate drawings
- 2100 ft^2 one story single family
- 2700 ft^2 two story single family
- 6960 ft^2 two story 8 unit multifamily
  - Four 780 ft^2 units
  - Four 960 ft^2 units

2100 ft^2 Perspective





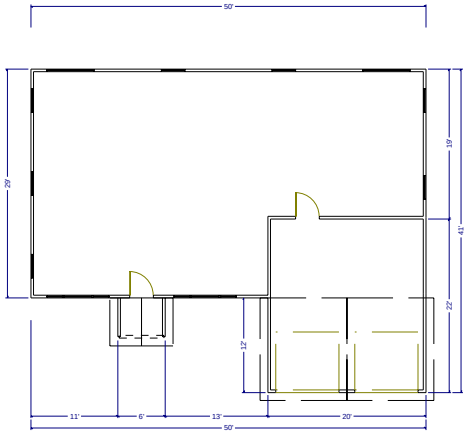
2100 ft^2 Floorplan

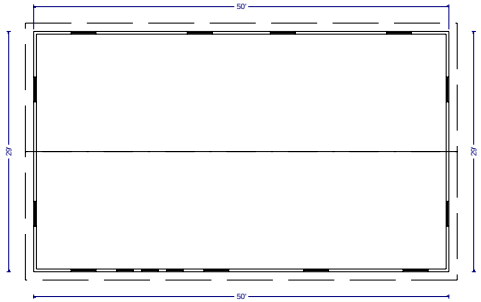


2100 ft^2 Description

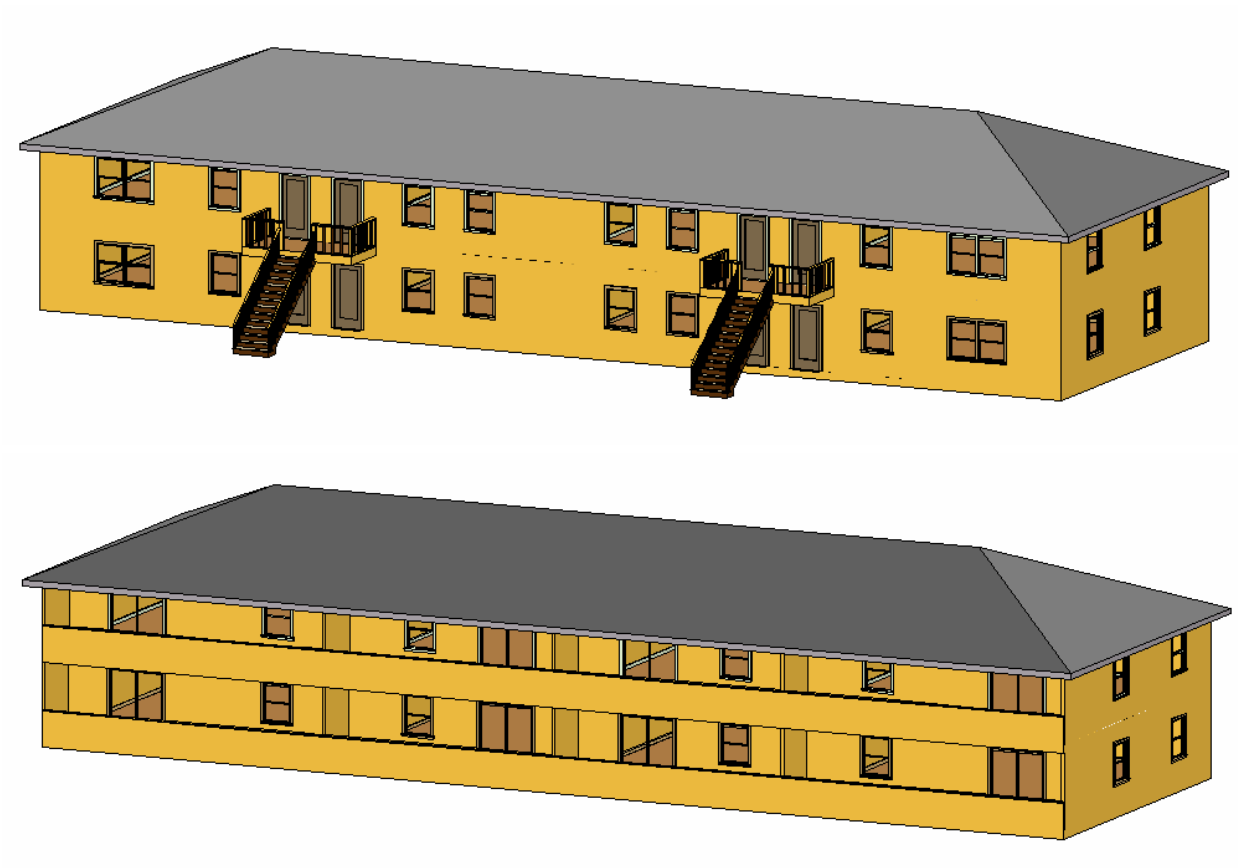
Component	Description
Ceiling height	9 ft
Conditioned floor area	2100 ft2
Conditioned volume	18900 ft2
Gross areas	
Slab	2100 ft2
Slab perimeter, outside	162 ft
Slab perimeter, garage	30 ft
Ceiling	2100 ft2, vented attic
Front wall	270 ft2
Front garage wall	180 ft2, shaded
Left wall	324 ft2
Left garage wall	90 ft2, shaded
Back wall	450 ft2
Right wall	414 ft2
Doors	
Front door	20 ft2
Garage door	20 ft2
Overhangs	1 ft (when modeled)

2700 ft^2





6960 ft^2 Perspective



6960 ft^2 Floorplan